U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

Navigate with Confidence

NOAA Navigation Services

The U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) Navigation Services supports America's economic vitality. Together, four navigation offices provide the essential tools and services, helping to ensure safe and reliable marine transportation in today's changing global environment.

The Office of Coast Survey (OCS) maps the coastal seafloor, provides the nation's nautical charts, and quickly conducts hydrographic surveys following storms or other emergencies.

Using state-of-the-art methods, the National Geodetic Survey (NGS) offers precise positioning and advanced geodetic, photogrammetric, and remote-sensing techniques to establish and maintain a consistent national positioning system.

Collecting, analyzing, and distributing both real-time and historical oceanographic observations and predictions, the Center for Operational Oceanographic Products and Services (CO-OPS) provides water level, current, and meteorological information.

Responding to environmental threats, the Office of Response and Restoration (OR&R) promotes sound decision making in the coastal zone.

Waterborne cargo contributes more than $742 billion to the nation's economy and creates employment for more than 13 million citizens.

Supporting Marine Transport and Navigation

The U.S. Marine Transportation System (MTS) – an intricate network of navigable waterways, ports, and harbors – gives our nation competitive access to suppliers and markets around the world.

Mariners rely on NOAA's nautical charts, accurate positioning services, marine forecasts, and information on tides, currents, and water levels to move safely and efficiently in and out of U.S. ports.

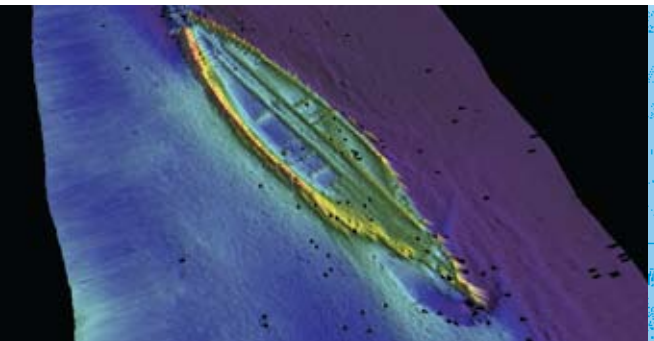
NOAA's navigation services are also used by the growing cruise line industry, national defense agencies, thousands of commercial fishing vessels, and millions of recreational boaters.

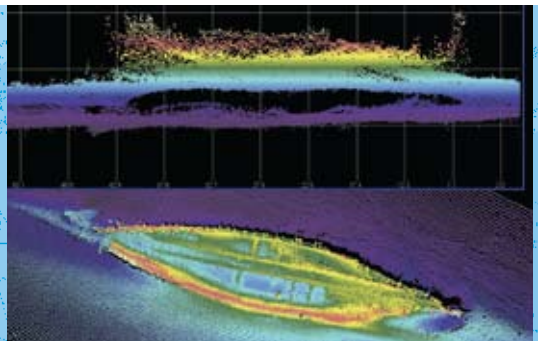
In the last 50 years, ships have doubled in length, width, height, and depth. Ships built today draw up to 60 feet of water – the equivalent of a five-story building. When transiting a channel, ships may have only inches between their hulls, the channel bottom, and the underside of a bridge. The National Spatial Reference System gives pilots consistent reference points for safe navigation.

Over 78 million boaters, using 18 million recreational boats, spend $39 billion a year. The U.S. fishing industry and its 110,000 fishing vessels contribute $35 billion annually to the U.S. economy.

Larger and faster vessels in increasingly crowded waterways are stretching the limits of the MTS.

Approximately 3,800 commercial shipping accidents and 5,000 recreational boating accidents occur annually. An emerging issue is the increasing number of bridge strikes – which cost time and resources, and endanger marine environments.





Protecting Our Ports and Waterways

In addition to contributing to U.S. economic vitality, NOAA's accurate navigation, information, and positioning tools contribute to national security and environmental protection. The U.S. Coast Guard and the Navy rely on NOAA products and services. Ports and coastal managers use NOAA tools to conserve oceans and coasts, locate and remove harmful debris, and protect the environment.

Supporting National Security

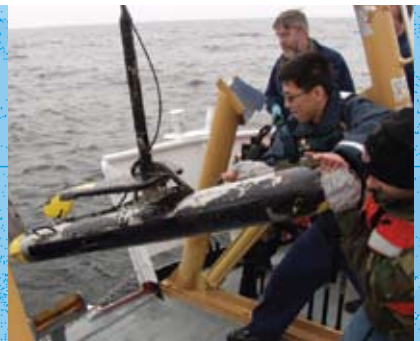
As gateways to our largest cities and industries, U.S. ports are strategic targets for terrorists and must be protected. NOAA's underwater surveying experts conduct port hydrographic surveys for navigation, military threat detection analysis, identifying vulnerabilities in infrastructure, and determining evacuation routes.

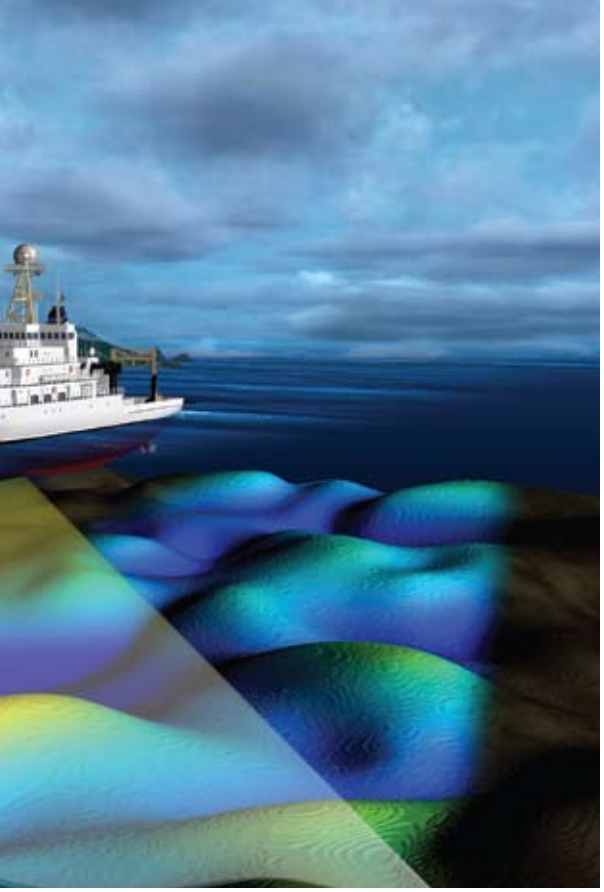
Locating and Removing Marine Debris

Marine debris – like lost fish nets, plastic bags and other human waste – interfere with navigation safety, hurt MTS shipping and coastal industries, and pose a threat to human health and marine life. Through surveying, research, removal, and outreach, NOAA is combating this growing problem.

Updating Vertical Control

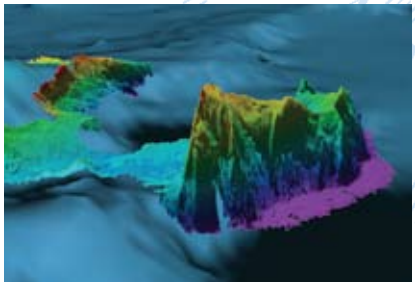
Knowing the relationship of water levels to land features is critical in determining an area's susceptibility to rising seas, lakes, or rivers. Local sea level rise, which is a combination of local and regional oceanographic change, global sea level rise, and the vertical land movement of an area, threatens coastal communities. Storm surge – temporarily rising waters – results in damaging floods, which further add to the threats. NOAA provides the geospatial information to help coastal managers better understand the interface between water and land, allowing for better planning of port operations, flood control measures, emergency preparedness, evacuation routes, and other contingencies.





Meeting New Challenges

Population growth, climate change, sea level rise, bigger ships, busier waterways, and aging coastal infrastructure are just a few of the challenges facing the marine transportation system. NOAA works with ports, coastal communities, and other constituencies to adapt to these challenges. With 3.4 million square nautical miles of constantly changing water, NOAA's work is more important than ever.



Exploring the Arctic

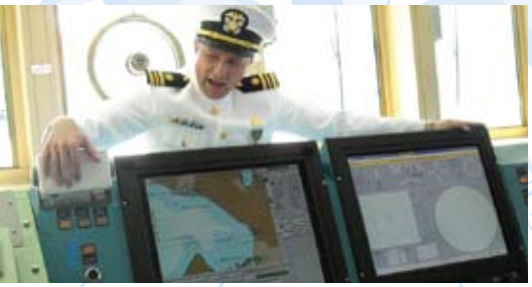
Melting sea ice in the Arctic is creating longer ice-free seasons and opening new opportunities for shipping. With more human activity in the Arctic, accidents in marine environments present unique challenges for response, assessment, and restoration. Limited resources, challenging conditions, and the remote location of disasters reduce operational options. Considering current knowledge and past experience with Arctic spill conditions, responding to a major oil spill in Arctic waters is problematic.

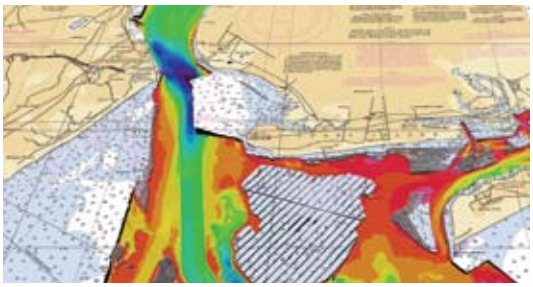
Supporting Coastal Communities

Sea level rise caused by climate change will have significant impacts on coastal communities and habitats. NOAA's geodetic data, seafloor surveys, and tide information can be used to develop programs that protect coastal infrastructure and ecosystems. Coastal zone managers also use NOAA charts, water level and current information, and elevation and shoreline data to plan coastal protection projects.

Providing Innovative Tools and Practical Assistance

NOAA's integrated suite of accurate, real-time navigation and positioning tools contributes to the strength of America's marine transportation system. With NOAA's support, the MTS can be the world's safest, most efficient, most competitive, most technologically advanced, and most environmentally responsible system for moving people and products.



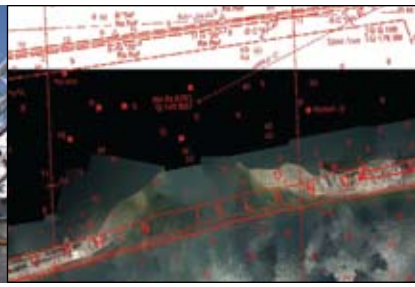


Pinpoint Positioning

NOAA's National Spatial Reference System and National Water Level Observation Network provide a highly accurate, precise, and consistent geographic reference framework throughout the U.S. The systems provide a foundation for determining land and water elevations. Precise positioning and accurate information on constantly changing water levels help mariners make the best decisions for safely maneuvering under a bridge or above an obstruction in our nation's busy waterways.

Mapping and Charting the Coast

NOAA uses sonar, photogrammetry, and remote sensing technologies to survey waterways for depths and obstructions. This information is used to define the national shoreline and update NOAA's nautical charts. Much like road maps, the charts provide the basic information necessary for safe marine navigation. With charts becoming increasingly electronic, mariners are able to more efficiently plan routes and avoid dangerous or ecologically sensitive areas.



Reporting Real-Time Data on Marine Conditions

Today's massive ships push the depth limit of many ports and harbors. To help mariners select the safest time to transit shallow waterways, NOAA delivers real-time tide, current, wind and bridge clearance data in a single, consistent coordinated system. Conversely, when marine winds push water into a port, shippers can decide to load extra cargo before heading to deep-water foreign destinations.

Responding to Disasters

NOAA's efforts speed the reopening of ports. Navigation response teams move into a coastal area after a storm moves out, and survey ports and channels, searching for submerged debris and finding alternative routes for commercial and military ships. NOAA aerial photography helps the public, decision makers, and insurance adjusters assess the extent of storm damage. Real-time data supports federal, state, and local decisions on post-storm response.

NOAA Navigation Services

Office of Coast Survey (OCS)
http://nauticalcharts.noaa.gov
(301) 713-2770

OCS offers a variety of navigation services. These include raster and electronic navigational charts, *Coast Pilot*, hydrographic surveys, water-level and current modeling, and emergency response teams. Navigation managers serve as OCS representatives in the field.

National Geodetic Survey (NGS)
http://geodesy.noaa.gov
(301) 713-3222

NGS applies state-of-the-art methods of precise positioning and advanced geodetic, photogrammetric, and remote-sensing techniques to establish and maintain a consistent national coordinate system. NGS manages the National Spatial Reference System, which provides the foundation for all geospatial products and services.

Center for Operational Oceanographic Products and Services (CO-OPS)
http://tidesandcurrents.noaa.gov
(301) 713-2981

CO-OPS collects, analyzes, and distributes both real-time and historical observations and predictions of water levels, coastal currents, forecasts, and other meteorological and oceanographic data. CO-OPS manages the National Water Level Program, the National Current Observation Program, and the Physical Oceanographic Real-Time System.

Office of Response and Restoration (OR&R)
http://response.restoration.noaa.gov
(301) 713-2989

OR&R responds to environmental threats and promotes sound decision making in the coastal zone. OR&R mitigates negative environmental effects that may be associated with oil and chemical spills from marine accidents by providing primary scientific support to cleanup agencies.

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